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Canada. Interdepartmental Skilled Manpower  
Training Research Committee.  
Report.

RESEARCH PROGRAM ON THE  
TRAINING OF  
SKILLED MANPOWER

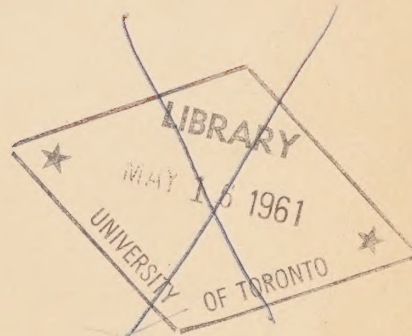
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No. 1

PROGRESS REPORT

JUNE 1957



Department of Labour, Canada  
in co-operation with federal and  
provincial government agencies and  
other groups



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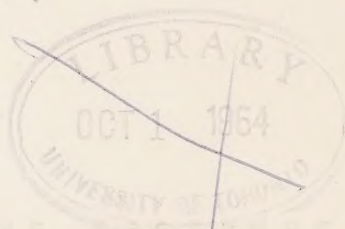
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## THE TRAINING OF SKILLED MANPOWER

Research Program, Department of Labour, Canada,  
in Cooperation with other Agencies

PROGRESS REPORT, JUNE 1957

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### Origin of Research Program

The need for a critical examination of changing requirements for skilled manpower in Canadian industries and occupations and for an assessment of available manpower has become increasingly evident during recent years.

In 1955 the Department of Labour along with provincial departments concerned had occasion to review technical training programs under a ten-year federal-provincial agreement then coming to an end. The Department of Labour also began special studies in that year in the manpower field at the request of the Royal Commission on Canada's Economic Prospects.

Each of these projects underlined the need for analysing changing manpower requirements, for estimating potential skilled workers among youth who are ready for training and among adults who need retraining, and for evaluating existing training facilities.

Later the matter was discussed at a meeting of the Canadian Vocational Training Advisory Council in February 1956. The Council concluded its discussion by recommending that the federal Department of Labour undertake research in these areas in cooperation with interested provincial departments, management, labour and other groups. This recommendation was subsequently endorsed by the National Apprenticeship Training Advisory Committee.





In these discussions it was agreed a research program along the lines indicated above was particularly timely. In many industries, technical changes in processes and products are taking place at an unusually rapid rate. These and other changes are greatly increasing the need for highly trained workers. Immigration, it was recognized, has made an important contribution to meeting this need over recent years, but this source may not be dependable in future with similar needs developing in the countries from which most of the people have come. On the other hand the number of Canadian born youth available for training will increase considerably over the next decade, thus requiring a large expansion of training facilities. Additional facilities may also be needed for adult workers who require training or retraining in new occupations. All of these developments underline the importance of reliable information and careful analyses in the development of sound types of training programs by public bodies, by industry and by other private bodies.

#### Establishment of Interdepartmental Committee

During the spring of 1956 the proposed research program was approved by the Department of Labour and by the Government and an interdepartmental Skilled Manpower Training Research Committee to plan and direct the program was established. The present membership of this Committee is:

#### Department of Labour

George V. Haythorne, Assistant Deputy Minister,  
Chairman

#### Training Branch

A. W. Crawford, Director  
C. R. Ford, Assistant Director  
S. R. Ross, Supervisor





Economics and Research Branch

W. R. Dymond, Director  
J. P. Francis, Chief, Manpower Analysis Division,  
Secretary  
Gil Schonning, Research and Development Section

Civilian Rehabilitation Branch

Ian Campbell, Co-ordinator

Women's Bureau

Miss Marion Royce, Director

Unemployment Insurance Commission

W. Thomson, Director, National Employment Service  
T. Fishbourne, Chief, Employment Specialist

National Research Council

F.L.W. McKim, Personnel Officer

Defence Research Board

H. W. Jamieson, Director of Personnel

Dominion Bureau of Statistics

Walter E. Duffett, Dominion Statistician  
E. F. Sheffield, Director, Education Division  
N. Le Seelleur, Chief, Elementary and Secondary  
Education Section

During the course of the first year, Mr. Dymond became Director of the Economics and Research Branch following Mr. Duffett's appointment as Dominion Statistician. Mr. Duffett continues as a member of the Committee representing the Dominion Bureau of Statistics and Mr. Schonning has been included in the Committee from the Economics and Research Branch.





The first task of the Committee was the preparation of a research outline. This outline, in slightly revised form, is included at the end of this report, beginning on page 18.. It sets forth the purpose of the research program, the short and long-term objectives, and describes in some detail the scope of the research.

The research outline is a comprehensive one designed to set forth the main subjects requiring attention in a co-ordinated fashion over a period of years. This facilitates a priority of research projects to be established and proceeded with each year while still maintaining a perspective of the over all program.

#### Work in 1956

During the summer of 1956 it was decided to concentrate research on some aspects of the second, third and fourth parts of the outline. Studies were made of technological and other changes and their effects on occupational requirements for skilled workers (section 2c. of research outline), of the scope and characteristics of the occupations usually referred to as "technician" (section 1 b.), and of the training and employment background of a sample of competent workers in several occupations (section 4 a.).

The Training Branch of the Department of Labour undertook, in co-operation with provincial departments concerned, a review of existing training facilities both on a municipal and a provincial basis (section 4 b(1) ).

A survey of the extent of organized trade training programs in industry (section 4 b. (3) ), a review of postwar requirements and shortages of skilled manpower and of trends over the next decade (section 2 a.), and an analysis of available supplies of youth and older workers requiring training (section 3), were undertaken by the Economics and Research Branch, partly in connection with this research program and partly in response to a request from the Royal Commission on Canada's Economic Prospects for studies in these fields.

Six university personnel were engaged, under special contract with the Minister of Labour, to undertake the field inquiries conducted during the summer of 1956. More specifically, these inquiries were:





(1) Technological and other changes occurring in selected manufacturing industries (electrical and electronic products, heavy industrial machinery, and some chemical, aircraft and automobile firms) located primarily in the Montreal and Toronto areas; current sources of skilled manpower and training facilities provided in the industry were reviewed and some enquiries were made of the requirements, recruitment and training of "technicians".

(2) A study of the way in which qualified workers in selected occupations (senior draughtsman, electronic technician, tool and die maker, sheet metal worker, floor moulder) have acquired their skills.

Professor W. G. McIntosh of the Mechanical Engineering Department of the University of Toronto, Professor W. Bruce of the Mechanical Engineering Department and Professor R. A. Chipman of the Electrical Engineering Department of McGill University undertook field work on the first project.

Mr. B. A. McFarlane of the Sociology Department of McGill, Mr. J. Clake of the Psychology Department of the University of Toronto, and Mr. H. W. Savage of the Ontario College of Education, Toronto, assisted in the field surveys carried out under project No. 2.

During the course of the summer regular meetings were held by the working committee, attended by the university personnel who were engaged in field work. This provided an opportunity for keeping in close touch with field activities and for reviewing the progress of the investigations as they were conducted.

Meetings were also arranged during the summer with the Employment and Education Committee of the Canadian Manufacturers' Association, the Industrial Relations Committee of the Radio Electronics and Television Manufacturers' Association and the Canadian Labour Congress.

Various members of the committee also consulted with the Bureau of Apprenticeship and the Bureau of Labor Statistics of the United States Department of Labor, with the U. S. National Manpower Council in New York; with the Ministry of Labour and other agencies in the United Kingdom, the European Productivity Agency and the International Labour Organization.



Excellent support and assistance have been received in the research program from provincial departments, labour and management organizations, individual employers and others. Over the past year there has been a marked increase in interest in the training of skilled workers in Canada, in a critical examination of the requirements and available sources of manpower, and in the provision of suitable training facilities. Among the many evidences of this increased interest were discussions at a conference convened by the A. V. Roe Co. at St. Andrews in September and at a special meeting on the "Crisis in Education" convened by the National Conference of Canadian Universities in Ottawa in November. Those and other public discussions are making a substantial contribution to the understanding of current manpower and training problems.

Although still of a preliminary nature the results of the research program to date have been of substantial assistance in connection with the consideration of new training agreements now being made between the federal and provincial governments to cover federal assistance in the construction and operation of vocational and technical training facilities over the next five years.

The initial work which has been done on this research program, while in some respects essentially explorative in nature, will provide a basis for the development of further studies as the research program continues.

#### Preliminary Findings of the Research Program

One of the major difficulties for research and other activities concerning the training of skilled manpower is the great variety in the types of work performed and the training courses available in various occupational fields. This raises many problems in distinguishing occupations, in determining different levels of competency and in establishing comparability in types of training available throughout Canada. One of the objects of this research program, as indicated earlier, is to obtain information which will serve as a basis for developing acceptable definitions in these areas. As a result of the exploratory work to date a clearer picture is being obtained of the inadequacy of some existing definitions, of areas where new ones are needed and of tentative formulations in some cases.





1. Effects of Technological Change on Requirements and Training of Skilled Manpower

As pointed out earlier, these investigations were conducted by three engineering professors who interviewed many levels of management down to the direct supervisory level. The interviews concentrated on firms in the electrical and electronic products, heavy industrial machinery, and aircraft industries, as well as some chemical and automobile firms. Most interviews took place in Montreal and Toronto. Some of the early findings are as follows:

(a) There was clear evidence in these industries of an increasing application of scientific methods both to the products manufactured and to the production processes involved. This appears to be symptomatic of changes taking place generally throughout the Canadian economy. The rapid growth of output and increasing wage costs have tended to speed up the rate of technological change. Such changes have resulted in greatly increasing requirements for skilled and technical manpower and have given rise to modifications in the kinds of skill and knowledge required of workers. As a consequence of these and related developments, the proportion of indirect to direct labour employed in these industries has increased in recent years.

(b) In many cases it was difficult to measure the effects of individual technological changes on specific occupations. In total, some new types of skilled and technical occupations appear to be emerging, others are being modified, some are declining in importance, and a great number are not experiencing significant changes. Many of the new occupations are emerging on the "technician" level between the skilled tradesman and the professional engineer or scientist. On the whole the increased requirements for skilled tradesmen and particularly technicians have tended to reduce at least relatively, the requirements for semi-skilled assemblers and machine operators.

(c) There was evidence of much managerial interest in the problems of recruiting and training of skilled and technical manpower. This interest also manifested itself in an increased emphasis on in-plant training and in a wider recognition of the need for increased technical and vocational training facilities.





(d) Management personnel generally indicated that in their view, youth desiring to enter many of the skilled trades, and especially the advanced technical occupations, should be assisted in the selection of suitable subjects, and encouraged to complete their high school education. This was felt to be important because of the much greater emphasis placed on having at least an elementary knowledge of science and mathematics in these occupations.

(e) Management in a number of firms indicated little contact with public educational institutions. As a result senior officials in these firms lacked an appreciation of the training that is, or that might be carried on in technical and trade schools.

(f) Apprenticeship and trade schools training were not considered particularly important as a source of skilled manpower in the electrical products and chemical industries, but played an important part in the training of skilled workers in the heavy industrial machinery, aircraft and automotive parts industries. Because of today's rapidly changing occupational requirements there was some uneasiness about the effectiveness of apprenticeship training as it has evolved traditionally.

(g) It was indicated that more consideration should be given to the role of public training institutions in the development of apprenticeship, including the need for flexibility in entrance requirements, the importance of some uniformity in instruction by qualified persons and adjustments in the length and character of the training received in keeping with industrial requirements.

(h) There was an almost unanimous view on the part of employers that Canada needed increased numbers of technical institutions to provide training for technicians and other highly trained specialists at levels beyond the secondary school.

These facilities should provide both day and evening classes. It was apparent that this is a rapidly growing field of employment and that the development of such institutions will help, in part, to relieve pressures on university engineering facilities.



(i) Many employers expressed interest in the national certificates for technicians and other types of skilled manpower which had been obtained by many workers from the United Kingdom. Such certificates enable the employer to evaluate more readily the qualifications and training of prospective employees.

(j) It was generally agreed there is an urgent need for increased numbers of competent mathematics and science teachers in the secondary schools.

## 2. The Acquisition of Skills Survey

During the summer of 1956 approximately one thousand interviews were undertaken of qualified workers in five occupations; tool and die maker, sheet metal worker, senior draughtsman, electronic technician and floor moulder. This involved interviews of a sample of one to two hundred workers in each occupation. Only workers at the full competence level, or who were foremen, were interviewed. Although the field work was limited to the Montreal and Toronto areas, those interviewed included people trained in all parts of Canada as well as in other countries. The concentration of industries in these two areas employing substantial numbers in these occupations, moreover, provides a representative cross-section of the labour force in these trades.

The purpose of the interviews was to obtain detailed information on the training and employment background of each worker. A detailed knowledge of how skilled workers have acquired their skills and what training they have undertaken will assist in providing new insights into future desirable changes in the nature of training, at least for these and similar occupations. Such information will enable comparison to be made between older and younger workers in terms of the type of training and experience they have received; between older and newer occupations, e.g., floor moulders and electronic technicians; between immigrants and native Canadians; between workers in various industries; and between foremen and journeymen. Views were also secured from the workers themselves on the most important parts of their training from the point of view of acquiring skills.

As yet these data have not been subjected to detailed analysis. Preliminary impressions are as follows:





(a) There appears to be a diversity of ways and means of becoming a skilled tradesman in the case of Canadian born tradesmen in the occupations covered. On the whole more have obtained their skills through informal on-the-job training than through apprenticeship or through other types of more formal training.

(b) Immigrants by and large have received more formal training than Canadians through apprenticeship programs or in technical institutions of various kinds. Their training also seems to have involved a greater integration of classroom and on-the-job training.

(c) The data suggest it takes longer to become a skilled tradesman by informal methods than by organized training arrangements such as apprenticeship. This impression will be checked in more detail at a later stage.

(d) The information suggests that the newer and growing occupations, such as electronic technician and draughtsman, require a broader general background of training with more concentration on mathematics and science, and frequently training in technical institutes beyond high school level. This kind of previous training and educational background contrasts with training for such occupations as foundry workers and sheet metal workers which may only require one or two years of high school.

### 3. Survey of Public Vocational and Technical Training Facilities

After considerable discussion and consultation with provincial representatives, an outline of the information desired with respect to training facilities was submitted to each province. It covered expenditures, types of schools, courses, enrolments, and graduates over a five-year period. All provinces submitted reports varying from a few pages of statistical data to many pages of detailed information. Despite full co-operation, it has not yet been found possible to compile a complete and comprehensive report for Canada. This is due in part to incomplete data but more particularly to differences in terminology regarding schools and courses and differing ideas with respect to the nature and content of those courses which might be designated as vocational and technical training designed to meet the needs of Canadian industry.





It is clear that careful follow-up work on the survey of training facilities is needed, particularly on descriptions of existing schools and courses at different levels including available statistics on enrolments and graduates, together with brief statements regarding trends and plans for the immediate future. With this in mind, further inquiries are planned in co-operation with the provinces.

It is now evident that the task of compiling appropriate comprehensive statistical data which will be acceptable to educators and other interested persons across Canada is one which will require careful study and continuing co-operative action on the part of all concerned over a period of several years.

One of the first problems to be solved in this connection is the development of definitions or standards regarding various types of schools or courses so that comparable data may be prepared by all provinces in each field and at each level of instruction.

The returns submitted indicated that total annual expenditures on all branches of vocational and technical training have increased from approximately \$29,500,000 in 1951 to nearly \$41,500,000 in 1956 and that there has been substantial growth in all provinces except Prince Edward Island, Manitoba and Saskatchewan.

Preliminary figures for enrolment for 1956 in full-time courses of those public schools and institutes which provide some form of vocational training totalled approximately 97,000 of whom approximately 37,000 or 38 per cent were enrolled in industrial and technical courses as distinct from commercial, agricultural and home-making courses. Of this 37,000, approximately 6,000 were enrolled in advanced technical courses, 7,000 in specialized short-term courses and 24,000 in general industrial courses of secondary schools. Over 47,000 were reported as enrolled in vocational evening classes.

In addition, there were 5,500 people enrolled in provincial vocational correspondence courses, about 10,000 in special classes for indentured apprentices, and over 30,500 in private trade schools.



#### 4. Survey of Organized Trade Training Programs in Industry

In 1956 the Economics and Research Branch included an item on organized training programs in selected industries in its annual Survey of Working Conditions across Canada. The questions on training programs and facilities were similar to those sent to firms in 1951 and 1954. Close to 7,500 establishments, usually employing more than 15 workers, in mining, manufacturing, transportation, and public utilities were covered. Some of the findings of this survey, included in a report entitled The Training and Recruitment of Skilled Tradesmen in Industry are:-

(a) The proportion of establishments with organized trade training programs was greatest in public utilities with 34 per cent followed by manufacturing with 29 per cent. Of all four industries covered manufacturing accounted for 89 per cent of all establishments reporting training programs.

(b) Within manufacturing, there has been a fairly substantial increase in the number of establishments with organized trade training programs since 1951. The proportions of manufacturing establishments reporting such programs in 1951, 1954 and 1956 respectively were 16 per cent, 23 per cent, and 29 per cent. These figures include both apprenticeship and non-apprenticeship training programs.

(c) In 1956, about one-half of the manufacturing establishments with training programs were training fewer than five people; only 9 per cent were training 25 or more workers.

(d) In the four industries covered, apprenticeship training programs were more widespread than non-apprenticeship programs. This was true in terms of both the number of establishments and the number of trainees. Three times as many establishments reported apprenticeship programs as compared to those stating they had formal non-apprenticeship training arrangements. In terms of trainees, the difference was not so great; the number of apprentices reported was about 50 per cent larger than the number of other trainees.





5. Trends in Requirements and Supplies of Skilled and Professional Manpower

A study conducted by the Department of Labour for the Royal Commission on Canada's Economic Prospects entitled Skilled and Professional Manpower in Canada 1945-1965 has been completed and will be published later this year by the Commission. It deals with trends in past and probable future requirements for and supplies of skilled workers (sections 2 and 3 of Research Outline). The main findings are as follows:

(a) Requirements for skilled manpower have expanded markedly, particularly in the postwar years. The growth in requirements for skilled workers is indicated by the fact that their number has increased at a more rapid rate than the labour force as a whole. Skilled workers amounted to 11.0 per cent of the labour force in 1931 and are estimated to be 16.3 per cent of the labour force in 1956. Shortages of skilled workers have characterized the post-war period in a number of years, indicating that the supplies available were not adequate to meet increasing requirements. These shortages were particularly intense in the years 1947, 1948, 1951 and 1956. Fortunately they have been mitigated to a considerable degree by a large immigration of skilled workers during recent years. With the constant expansion of the economy there are, however, continuing shortages of many groups of skilled manpower.

(b) These rapidly expanding requirements for skilled workers have not been matched by any comparable increase in the number of youth available for training. In fact, the population aged 15-19, the time when most people enter the labour force or begin their specialized training, has remained practically unchanged for the past 20 years. From 1935 to 1955, when national income, the labour force, and the number of skilled workers were increasing rapidly, boys and girls from 15 to 19 years of age varied only slightly in number between 1,000,000 and 1,100,000. By 1960, however, it is estimated that there will be 1,440,000 youth available for training, an increase of 340,000 from 1955.

(c) During the postwar period, net immigration of skilled workers has greatly augmented Canada's supplies of skilled manpower. Over the years 1946-55 inclusive, Canada enjoyed a net gain of some 100,000 workers (excluding agricultural and clerical). This net



immigration of skilled workers amounted to some 28,000 workers in the years 1946-1950, and to some 80,000 workers in the years 1951-1955. This addition to the economy's supplies of skilled tradesmen has exceeded the number of persons graduating from all public training programs during recent years.

(d) Shortages of skilled and technical workers are likely to remain over the next few years, assuming the economy continues to undergo at least a moderate rate of expansion. As indicated above, rapid increases are beginning to take place in the number of Canadian born youth in the training age groups. To secure a larger supply of skilled manpower from this source expanded training programs are needed. Immigration will continue to furnish some skilled workers but it cannot be depended upon too strongly when requirements of skilled workers are also increasing in other countries.

#### The Program for 1957

The first task for 1957 is to complete the analyses of the information obtained from the studies undertaken during 1956. Some of these analyses were completed in a preliminary form and presented to the Canadian Vocational Training Advisory Council at its March, 1957 meeting. Reports on the effects of technological change on requirements and training of skilled manpower in the electrical products and electronics industry and in the heavy machinery manufacturing industry will be completed first. These will be followed by reports on the occupations covered in the acquisition of skills project.

It is also proposed to undertake additional work along the following lines:

1. Effects of Technological Change on Requirements and Training of Skilled Manpower

The studies conducted last year indicate the need for additional quantitative information on the changing requirements for different categories of skilled and professional workers. Important manpower changes which have occurred or which are expected to occur over the next five to ten years will be examined in terms of both broad levels of skill and important functional groups. Examples of changing job content will also





be studied in representative occupations in these broad skill and functional categories. This information will be obtained for establishments which make representative products in industries where important technological and other changes are taking place. In some cases establishments may be chosen with relatively homogeneous industrial processes in order to study more direct relationships where these occur between technological and manpower changes. The co-operation of firms will be necessary in order to secure the data required on present, past and probable future numbers of skilled and professional occupations, their qualifications and the work they perform. Information will also be needed on changes in production methods and equipment, on the length of the training period required to qualify workers for different occupations, on the reasons for changes in occupational requirements and on new occupations that may be developing.

## 2. The Acquisition of Skills Survey

It is planned to conduct interviews of competent workers, similar to those undertaken last year, in engineering and possibly a few other occupations. Information on the education and training background of people performing engineering jobs for industry as well as on the kind of work they are doing will help to document more fully the various sources from which industry obtains engineers and throw some light on the way in which they are utilized. It is hoped that such information will also help in assessing the relationships between work usually done by professional engineers and that which might be performed by highly technical workers.

## 3. Review of Training Facilities

The review of existing training facilities which began in 1956 in co-operation with provincial departments will be continued. The material already assembled will be analysed and additional data where necessary will be obtained.

## 4. Assessment of Occupational Trends

Using statistical information available from the Census of Canada and the annual Survey of Wage Rates of selected occupations conducted by the Department of Labour, an attempt will be made to develop more comprehensive data on occupational trends during the last few decades. Some information of this type has already been developed from the Census by the Dominion



Bureau of Statistics. The Economics and Research Branch has started work with the Dominion Bureau of Statistics to extend this information to a broader range of occupations, supplementing it by using data on the number of people in more specifically defined occupations obtained from the annual Survey of Wage Rates.

#### 5. Other Projects

If resources permit, it is planned to examine the training provisions contained in collective agreements and to make some enquiries of what happens to students who drop out of various technical and vocational courses, and of the types of employment secured by those who complete such training.





## A P P E N D I X

### RESEARCH OUTLINE

As prepared April, 1956, with minor revisions

#### Purpose of Research Program

A broad study of training requirements and facilities is needed, particularly in view of the current rapidly changing complexion of many Canadian industries requiring increased numbers and new types of skilled workers.

This study will help to provide reliable information and supporting data to assist management, labour, government bodies, educational agencies and the public generally in reviewing and assessing the policies and actions which might best be taken in this important field.

The study will serve to point up for management and labour groups the current types of training in industry and the principal changes needed in future to improve the skills of the labour force.

Provincial and local authorities are facing the problem of providing additional and usually relatively expensive vocational and technical training facilities at a time when greatly increased enrolments are involving heavy financial commitments for elementary and secondary education. The problem is intensified by a shortage of qualified teachers, particularly for specialists in the secondary schools. There is, fortunately, a steadily expanding demand for post secondary school education but the universities are also finding it increasingly difficult to provide adequate facilities. Existing and new programs for training technicians and other groups of skilled manpower should be as effective as possible to meet the growing requirements and also to help ease the shortages of professional personnel.

Increasing numbers of skilled workers are essential for the continuing development of our industries and resources. Also, the acquisition of appropriate manpower skills is a vital phase of defence preparedness. Immigration, while an important source of skilled workers, cannot be relied upon too heavily. There is, moreover, an urgent need to explore and to develop the potential resources of skilled manpower among our Canadian born population.



Since substantial expenditures are involved in improving manpower skills it is important to review current training programs to ensure that present and future expenditures by industry and government on a local and national basis are used in the most effective manner.

Present and future manpower training needs in Canada have been under consideration at meetings of the National Vocational Training Advisory Council. The Council has proposed revised financial arrangements under the federal-provincial training program for erecting, equipping, staffing and operating technical and vocational schools. At its meeting in February, 1956, the Council requested a study of this kind be undertaken as soon as possible by the federal Department of Labour in co-operation with provincial departments and other interested agencies. The request was endorsed subsequently by the National Apprenticeship Advisory Committee.

#### Immediate and Longer-Term Objectives

The study will endeavour to meet both immediate and long-run objectives. An initial analysis will be made of skilled manpower requirements in selected industries, of available supplies and of existing facilities. This will be of assistance to industry and governments in deciding what changes need to be made in the nature and extent of technical and vocational training facilities across Canada for the years immediately ahead.

In addition to the training requirements and the ways in which these can best be met over the coming years, there are other aspects of technical and vocational training which will need consideration over a longer period by all interested groups. These longer-run questions include a consideration of measures to deal with the employment of those who drop out of training courses, of vocational guidance practices and information, and of other factors affecting occupational choice.

This research program will be centered on vocational and technical training as distinct from general education. It is recognized, however, that there is an important relationship between the training provided for tradesmen, technicians and other groups of skilled manpower and the general education they receive. This relationship must be kept in mind at all times. While the main emphasis will be on vocational and technical training, reference will be made where appropriate to professional training.





## Proposed Research Outline

### 1. Introduction

- a. Purpose and scope of research program.
- b. Definition of terms used in the study such as "vocational training", "on-the-job training", "formal" and "informal training", "education", "skilled worker", "technician", "professional worker" and "vocational guidance".

### 2. The Changing Requirements for Skilled Manpower in Canada

- a. Critical analysis of manpower requirements during postwar years by broad industry groups and by provinces with some reference to pre-war years to provide general historical perspective.
- b. Analysis of manpower shortages in skilled occupations on a national and provincial basis, identifying occupational areas where supplies lag most persistently behind demand. This analysis will be based on National Employment Service statistical and narrative reports, as well as on the results of field interviews in industry with persons in selected occupations.
- c. The effects of technological and other changes on requirements and training of skilled manpower. An attempt will be made to determine the impact of technological, organizational and other physical and social changes on occupations with particular reference to tradesmen and technicians in industries in which important technological changes have occurred or are expected to occur. Attention will be paid to the existing facilities and needs for retraining as well as training. This will require field studies in co-operation with selected industries and firms. It will also involve consultations, where appropriate, with management and labour organizations. Any relevant studies of similar industries in the United States, the United Kingdom and other countries will be examined.



- d. Where possible an assessment of changing requirements for different kinds of skilled workers during the next ten years will be made on the basis of the analysis in b. and c. above, and in the light of information on probable future trends in industrial growth. An attempt will be made to indicate those skilled occupations where requirements will be increasing rapidly.

### 3. Manpower Available for Training or Re-Training

- a. An analysis of the changes occurring in the number of youth in Canada during recent years, together with a consideration of the factors affecting these changes. Where possible this analysis will be made by province and sex.
- b. The number of youth in the age group 15 to 19.
  - (1) Enrolled in full-time school courses.
  - (2) In employment.
  - (3) At home.

The proportion of those at school and in employment who are engaged in organized vocational or technical training activities will also be analyzed. Changes that have occurred in these numbers and proportions over recent years will be examined.

Again, where possible, this analysis will be made by province and by sex.

- c. A projection of the numbers of people in the age group 15 to 19 in 1960 and again in 1965 with estimates also of the numbers who will be at school, in employment and at home. Allowance will have to be made in both b. and c. for overlapping between those at school and those in employment. Where possible, these projections will be made by province and sex.
- d. The numbers of adults receiving training today and the factors likely to influence the need of such training in 1960 and 1965 including (1) new and re-entrants to the labour force, (2) up-grading, (3) workers displaced from their jobs, (4) those requiring rehabilitation training.





- e. Some consideration of the recent and probable future supplies of skilled manpower from other countries including any special training courses or arrangements provided for recent immigrants.

#### 4. An Appraisal of Means and Practices of Acquiring Skills

- a. An analysis of how competent workers in skilled occupations have acquired their competency through formal training, job experience, or a combination of both. This analysis, which will be based largely on interviews of a sample of selected workers, is designed to help determine the relative importance of formal training in schools, in industry, or both, in relation to work experience. Workers will be selected for interview mainly in industries and occupations where rapid changes in requirements are occurring. Some apprenticeable trades may be included to obtain information on the importance and value of formal apprenticeship. In these studies, some attempt will also be made to find out what factors influence workers in entering occupations and the role played by vocational guidance and counselling. The views of foremen and other senior plant personnel will be secured on the most effective methods of training skilled workers and technicians.
- b. Up-to-date information will be assembled and compiled on existing training courses and programs established under government, private educational and industry auspices across Canada. Recent developments and trends will be examined including plans for expanding existing or for introducing new vocational and technical courses for skilled workers and technicians over the next ten years. An assessment of the effectiveness of existing training courses and programs will be made in relation to the developing needs of industries as determined by other surveys. An examination will be made of the part played by employers' organizations, unions and joint committees in training programs and of the division of responsibility among governments, industry and organized labour for financing and providing these training courses and programs. This part of the study will be divided into four main sections:



(1) Publicly Administered Training Courses and Programs

Vocational and Technical Training courses are provided under government auspices in a wide range of industries and occupations by various types of schools, institutions, and agencies across Canada. These include regular secondary schools, composite schools, vocational high schools, technical high schools, trade institutes, mobile schools and technical institutes. The overall provisions in these training institutions will be reviewed followed by more detailed descriptions of the courses provided in each province. This will include the facilities provided, expenditures, duration and time, entry qualifications, numbers of students graduating, guidance activities, level of competence achieved at the end of the course, training facilities for and sources and qualifications of teachers, placement of students including steps taken by training institutions to maintain relations with the National Employment Service and with industry. An over-all examination will be made of the training capacity in each province together with an assessment of the use of existing and planned facilities.

(2) Training Courses and Programs Provided Under Private Educational Auspices

Information will be compiled on the courses and activities of private training agencies operating in Canada, indicating the areas served, types of training offered, students graduating, fees charged, duration of courses, liaison with public and industrial training programs and the degree of supervision over such training courses and programs.

(3) Training Programs in Industrial Establishments

An analysis will be made, based on existing information and on additional data secured through field surveys, of the types of training carried on in industry including plant schools, apprenticeship, supervised training on job, training through experience, and other types of industrial training.

In apprenticeship training, the extent to which training is carried on jointly by industry and training institutions will be analyzed. The extent and significance of the current trade analysis program, the trend away from fixed quotas of apprentices and the development of improved selection through pre-apprenticeship instruction or employment will also be considered.





(4) Training Courses Connected with Other Government and Educational Programs

Studies will be made, where appropriate, of other types of training which make important contributions to the supply of skilled workers. These might include training in the Armed Services, rehabilitation training, the training or re-training of unemployed workers, training of technicians and other skilled manpower provided by universities and training facilities in the United States and other countries through which Canadians acquire technical skills. In each case information will be secured on the kind of courses offered, the number of people trained, the level of competence achieved, and the ways in which the training is provided.

5. Special Factors Affecting the Training of Skilled Manpower

- a. Factors influencing youth to decide to undertake vocational and technical training or to enter skilled trades. Attention will be given to the way in which young people enter various occupational fields. While part of a broader problem, it is important to evaluate the degree to which potential resources of skilled manpower are under-utilized through the failure of young people to take the training for which they have aptitudes and with which their opportunities for employment would be improved. The place of vocational guidance and information in making occupational choices will be considered including the services provided by educational institutions, the National Employment Service and other agencies.
- b. Some attention will be given to the factors influencing youth to stop school before they have completed their courses of training including the impact of financial and other circumstances.
- c. Special factors involved in training or re-training adult workers will be considered including assessing potential abilities, types of guidance needed, appropriate job opportunities and suitable training programs and facilities. Services for adult workers in some of these and related fields are now provided by employers, by the National Employment Service and by provincial agencies under the Federal-Provincial Technical Training Program.



## 6. Evaluation

An attempt will be made to evaluate the extent to which training of all kinds has been meeting the requirements of skilled manpower in industry in recent years and is likely to do so in the light of the changing needs in the future. The main problem areas and gaps will be discussed in relation to probable future needs. The present utilization of existing facilities will be analyzed from the standpoint of changing occupational requirements for formal training. Particular attention will be paid to the relative importance of formal technical or vocational schooling, organized in-plant training, and on-the-job experience and upgrading; the changes indicated in the types and methods of training and retraining; and to the provision of guidance, counselling and other methods of encouraging young and older workers to improve their skills.







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Publications

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Government  
Publications

~~LC~~ Canada. Interdepartmental  
~~1047~~ Skilled Manpower Training  
~~C2A384~~ Research Committee  
~~no.1~~ Report

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